

Claims

1. A grader attachment for a loader type utility vehicle which utilizes the auxiliary hydraulics of that vehicle comprising:

an elongated frame member having a proximal end for attachment to the vehicle and a distal end with at least one steerable wheel;

a blade positioned between the proximal end and the distal end of the elongated frame member;

a blade control means;

a steering means;

a propulsion control means; and

a safety valve/back pressure valve comprising a check valve, a first electric cartridge valve, an at least second electric cartridge valve, and a pressure reducing valve, the safety valve/back pressure valve receiving fluid from the auxiliary hydraulics of the vehicle;

wherein the fluid is directed through the first electric cartridge valve to a tank port when the attachment is not in use;

wherein the fluid is blocked by the first electric cartridge valve when the attachment is in use; and

the fluid is directed to the check valve, fluid passing through the check valve is directed through a main equipment valve to the blade control means, the main equipment valve comprising a main relief valve and a power beyond plug to direct fluid to the steering means; and fluid blocked by the check valve is directed through the pressure reducing valve and through the second electric cartridge valve through a hydraulic remote control valve to the propulsion control means;

whereby the safety valve/back pressure valve provides fluid under pressure to control the steering of the vehicle and the attachment, to control the propulsion of the vehicle and the attachment and to control the movement of the blade by utilizing the auxiliary hydraulics of the vehicle.

2. The grader attachment of claim 1, wherein said blade control means comprises at least one control lever, and at least one blade positioning cylinder.

3. The grader attachment of claim 2, wherein said at least one blade positioning cylinder includes at least one blade lift cylinder to lift said blade from a ground surface and at least one blade angle cylinder to rotate said blade across the ground surface.

4. The grader attachment of claim 3, wherein said at least one blade positioning cylinder further includes at least one blade tilt cylinder to tilt said blade into said ground surface.

5. The grader attachment of claim 1, wherein steering means comprises a steering orbital and a steering wheel.

6. The grader attachment of claim 1, wherein said propulsion control means comprises an operator control means by which an operator can control propulsion of said vehicle and attachment, said hydraulic remote control valve providing fluid to a travel cylinder, the travel cylinder operably connected to a bell crank and the bell crank operably connected to connecting means which connect the bell crank to the hand controls of said vehicle.

7. The grader attachment of claim 6, wherein said connecting means include a travel rod stroked by said bell crank, a travel cross bar pivotally connected to the travel rod, and hand control connecting rods that connect to said hand controls of said vehicle.

8. The grader attachment of claim 6, wherein said operator control means is a foot pedal.

9. The grader attachment of claim 6, further comprising a centering system to return said travel cylinder to neutral when said operator releases said operator control means.

10. The grader attachment of claim 9, wherein said centering system comprises a centering spring operably connected to said travel cylinder, the centering spring comprising a rod assembly comprising a rod and a sleeve, a portion of the rod is surrounded by a spring member, the rod and spring member are encased in a spring tube, the spring tube including two end caps, each end cap comprising at least one spring seat, wherein moving said travel cylinder by moving said operator control means of said vehicle compresses the spring and releasing said operator control means allows the spring to expand and to seat on the seat members.

11. The grader attachment of claim 9, wherein said centering system comprises a travel centering bar, a centering spring, and at least a forward centering bearing and at least a reverse centering bearing, wherein moving said travel cylinder by moving said operator control means of said vehicle causes said bearings to move along the travel centering bar causing the travel centering bar to pivot on a hinge and releasing said operator control means causes the spring to return said centering bar to neutral.